What is claimed is:

1. A device for measuring vibration in an article having a rotating member, the device comprising:

a motion sensitive transducer attachable to the article comprising an output producing a time domain analog signal in response to the vibration;

an analog-to-digital data acquisition member comprising an input connected to the transducer output for sampling the transducer signal and comprising an output producing a time domain digital signal from the sampling;

a timing sensor adapted to detect an instantaneous speed of the rotating member and triggering the data acquisition member to begin sampling when the rotating member is rotating; and

a processor comprising an input connected to the data acquisition member output for translating the time domain digital signal to a frequency domain digital signal and determining the magnitude and phase of the vibration signal at a frequency associated with the instantaneous speed of the rotating member.

2. The device of claim 1 wherein the processor further comprises a comparator determining whether the magnitude of the vibration signal at the frequency associated with the instantaneous speed of the rotating member is greater than a preselected threshold.

3. The device of claim 1 wherein the instantaneous speed is associated with a transient start up state of the article's rotating member and is less than the operating speed of the rotating member.

4. The device of claim 1 comprising two transducers producing simultaneous vibration signals from different planes.

5. The device of claim 4 wherein the transducers are positioned orthogonally.

6. The device of claim 1 wherein the timing sensor comprises an optic sensor that is responsive to a target feature on the rotating member.

7. The device of claim 1 wherein the processor performs a Fourier transform in translating the signal from the time domain to the frequency domain.

8. A rotating disc data storage device balancer for measuring vibration comprising:

a motion sensitive transducer attachable to the data storage device comprising an output producing a time domain analog signal in response to the vibration;

a timing sensor adapted to detect an instantaneous speed of the disc stack; and

means for processing the transducer signal in determining a magnitude and phase of the signal at a frequency determined by the timing sensor.

9. The balancer of claim 8 wherein the means for processing is characterized by an analog-to-digital data acquisition member comprising an input connected to the transducer output for sampling the transducer signal and comprising an output producing a time domain digital signal from the sampling.

10. The balancer of claim 9 wherein the data acquisition member is triggered to begin sampling by the timing sensor when the disc stack begins rotating.

11. The balancer of claim 9 wherein the means for processing is characterized by a digital signal processor comprising an input connected to the data acquisition member output for translating the time domain digital signal to a frequency domain digital signal.

12. The balancer of claim 11 wherein the means for processing is characterized by a Fourier transformation.

13. The balancer of claim 8 wherein the means for processing is characterized by a comparator determining whether the magnitude of the vibration signal at the frequency associated with the instantaneous speed of the rotating member is greater than a preselected threshold.

14. The balancer of claim 8 wherein the instantaneous speed is associated with a transient start up state of the article's rotating disc and is less than the operating speed of the disc.

15. The balancer of claim 8 comprising two transducers producing simultaneous vibration signals along different planes.

16. The balancer of claim 15 wherein the transducers are positioned orthogonally.

17. The balancer of claim 8 wherein the timing sensor comprises an optic sensor that is responsive to a target feature on the rotating member.

18. A method for measuring vibration in an article having a rotating member, the method comprising:

orienting a motion-sensitive transducer on the article for detecting a vibration signal that is proportional to the article vibration along a desired direction;

detecting the instantaneous speed of the rotating member;

sampling and digitizing the vibration signal in obtaining a time domain digital signal of the vibration;

translating the time domain digital signal to a frequency domain digital signal; and

determining the magnitude and phase of the frequency domain digital signal at the frequency associated with the instantaneous speed of the rotating member.

19. The method of claim 18 wherein the sampling and digitizing step is initiated in response to the detecting step indicating a rotation of the rotating member that is greater than zero.

20. The method of claim 18 further comprising comparing the magnitude of the signal at the frequency associated with the instantaneous speed of the rotating member with a preselected threshold.